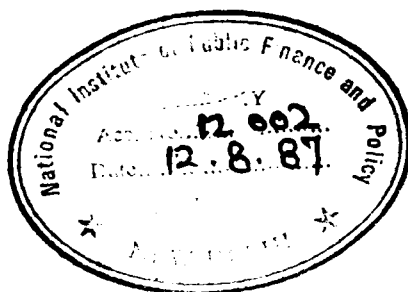


INCENTIVE EFFECTS OF
CAPITAL GAINS AND INHERITANCE TAXES
ON INTER-STATE MIGRATION:
THE HOLT AND SHELTON ANALYSIS REVISITED

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INCENTIVE EFFECTS OF CAPITAL GAINS AND INHERITANCE
TAXES ON INTER-STATE MIGRATION:
THE HOLT AND SHELTON ANALYSIS REVISITED

Do inheritance and capital gains taxes in Wisconsin induce elderly individuals to move out of the State? Considerable rhetoric makes claim to that effect. An answer to the question is important because of its implications on the capital flow from the State. The present study attempts to analyse the effect of capital gains and inheritance taxes on individual decisions to migrate. The conceptual framework presented extends the earlier perspective of Holt and Shelton (1962). Outcomes are then examined for the various alternatives.

Capital gains constitute the base of the capital gains tax, which is levied when ownership of property is transferred. The inheritance tax is levied on property at the time of death of the transferor and collected from the beneficiary of the estate. The tax levied depends on the amount of property received by the heir and his relationship with the deceased. Payment of capital gains tax in the present has the effect of reducing the potential value of property available for bequest and can be avoided. The inheritance tax reduces the amount of bequest received by the heirs, and can also be avoided.

It is assumed that the objective of the individual is to maximise the present value of his expected bequest net of taxes. The individual holds a certain property

in the current period and expects the value of property to appreciate to the time of his death. The present value of this expected bequest depends on actions taken by the individual in the present. Holt and Shelton (1962) examine the effect of capital gains tax on portfolio composition (hold versus switch alternatives). We consider the additional decision to migrate (stay versus move alternatives). Because these two decisions are sequentially ordered in time we must logically consider the following five alternatives:

- Alternative 1: (stay, hold) \equiv (hold, stay)
- Alternative 2: (stay, switch) \equiv (switch, stay)
- Alternative 3: (move, hold) \equiv (hold, move)
- Alternative 4: (move, switch)
- Alternative 5: (switch, move)

The order attaching to decisions involving no move, or involving no switch, is irrelevant. However, moving before switching shifts the legal jurisdiction of the capital gains tax as well as the inheritance tax. Switching before moving shifts the jurisdiction of the inheritance tax only.

Alternative 1: (stay, hold)

In this alternative the individual continues to stay in the State holding appreciated property. The property is liable only to transfer taxes. For exposition we consider only the State inheritance tax.

In this case, the present value of bequest (B) is;

$$(1) \quad B = \{ A - I(A [1+i]^k) / (1+i)^k \}$$

where A = initial value of property

I(.) = the inheritance tax function

i = rate of interest (in the present context the rate of interest is defined to include both current return and capital appreciation)

k = the number of years the individual lives from the present time. Using mathematical expectation, the present value of the expected bequest (EB_1) is defined as;

$$(2) \quad EB_1 = \{ A - \sum_{k=1}^{\infty} P(N,k) [I(A [1+i]^k) / (1+i)^k] \}$$

where $P(N,K)$ = the probability of death in the year k, of the individual who is presently of age N^* .

Alternative 2: (Stay, switch)

Under this alternative the individual sells the property, but chooses to stay in the State. In this case, he is liable for capital gains tax at the time of sale, thus leaving with him an initial value of asset less the capital gains tax. The property is again subject to the inheritance tax at the time of the individual's death.

* For instance $P(N,1), P(N,2), \dots$ denote the probability of death of an individual, who is of age N presently, in the next year, in the second year from the present and

so forth. $\sum_{k=1}^{\infty} P(N,k) = 1.$

The present value of expected bequest in this case (BE_2) is

$$(3) \quad EB_2 = (A(1-\lambda G) - \sum_{k=1}^{\infty} P(N,k) [I(A(1-\lambda G) [1+i]^k)/(1+i)^k])$$

where λ = the capital gains expressed as a proportion of the initial value of asset; and

G = capital gains tax rate of federal and state income taxes combined

Alternative 3: (move, hold)

In this instance, the individual holds the property and moves out of the State. Thus the property is liable only to the inheritance tax elsewhere.

The present value of expected bequest EB_3 in this case is:

$$(4) \quad EB_3 = (A - \sum_{k=1}^{\infty} P(N,k) [I'(A [1+i]^k)/(1+i)^k])$$

where $I'(\cdot)$ = inheritance tax function elsewhere.

Alternative 4: (move, switch)

Under this alternative, the individual moves out of the State and sells the property. It is assumed that he moves to a State where there is no State capital gains tax. In this case, the property is subjected to federal

capital gains tax and inheritance tax elsewhere. For this alternative, the present value of expected bequest (EB_4) is given by;

$$(5) EB_4 = A(1-G^*) - \sum_{k=1}^{\infty} P(N,k) \left[I^* (A(1-\lambda G^*) [1+i]^k) / (1+i)^k \right]$$

where G^* = the federal capital gains tax rate.

Alternative 5: (switch, move)

In this case, the individual sells the property in the State and moves out. Therefore, the property is taxed for the capital gains inside the State and inheritance elsewhere.

The present value of expected bequest in this instance (EB_5) is:

$$(6) EB_5 = A(1-\lambda G) \sum_{k=1}^{\infty} P(N,k) \left[I^* (A(1-\lambda G) [1+i]^k) / (1+i)^k \right]$$

We use this framework to examine the effect of State capital gains and inheritance taxes in Wisconsin on residents' decisions to migrate. The present value of expected bequests in Wisconsin is compared to that in a State where the capital gains and inheritance taxes are the least. The difference is computed for each of the five alternatives. The comparison provides insight into the significance of taxation as an incentive to migration.

Before making such a comparison it is essential to make the following observations. According to the federal and State income tax laws only 40 per cent of the capital gains is subjected to taxation. Moreover, State taxes are deductible from the federal tax base. This has the effect of reducing the marginal federal capital gains tax rate by unity less the State capital gains tax rate. Thus the combined federal plus State capital gains tax liability is computed as:*

$$(7) F + L = 0.4C (t_F - t_L \cdot t_F + t_L).$$

where F = the federal capital gains tax liability

L = the State capital gains tax liability

C = capital gains

t_F = the federal capital gains tax rate

t_L = the State capital gains tax rate.

$$* F = 0.4C \cdot t_F - L \cdot t_F \quad (a)$$

$$L = 0.4C \cdot t_L \quad (b)$$

$$F + L = 0.4C \cdot t_F - L \cdot t_F + 0.4C \cdot t_L \quad (c)$$

Substituting (b) in (c)

$$F + L = 0.4C \cdot t_F - 0.4C \cdot t_L \cdot t_F + 0.4C \cdot t_L$$

$$= 0.4C(t_F - t_L \cdot t_F + t_L) \quad (d)$$

Both federal and State governments levy death taxes. The State death tax in Wisconsin is a combination of inheritance tax and the 'pick-up' tax. The federal death tax is an estate tax. In computing the federal estate tax liability, a credit is given for the State death tax. The 'pick-up' tax provision is meant to fill the gap, if any, between the State death tax credit available and the State death tax; that is the inheritance tax. Since the inheritance tax levied in Wisconsin exceeds the State death tax credit, in most cases, 'pick-up' tax collection is negligible.

In contrast to Wisconsin, some States levy a death tax just equal to the federal death tax credit. These States provide the example for which the State death tax is the minimum. In the present analysis a comparison of the present value of expected bequest under the five conceptual situations is undertaken between Wisconsin where the death tax is mainly an inheritance tax and a typical States where the death tax is equivalent to the State death tax credit.

In view of the death tax system in Wisconsin and in the 'typical' State, it is necessary to modify the tax functions of the formulae for present values of expected bequest presented earlier. The modified formulae are as follows.

$$(2)' EB_1 = \{A - \sum_{k=1}^{\infty} P(N,k) [(I(A [1+i]^k) + E(A [1+i]^k) - S(A [1+i]^k)) / (1+i)^k]\}$$

where $E(\cdot)$ = the federal estate tax function, and,
 $S(\cdot)$ = the State death tax credit function.

$$(3) \quad EB_2 = \{A(1-\lambda G) - \sum_{k=1}^{\infty} P(N,k) [I(A(1-\lambda G) [1+i]^k) + E(A(1-\lambda G) [1+i]^k)] - S(A(1-\lambda G) [1+i]^k)\} / (1+i)^k$$

In modifying the expression for bequests with regard to alternative 3, the following observations may be made. Under this (move, hold) alternative, the property is liable to death taxes in the 'typical' State where the death tax equals the State death tax credit. In a State where the death tax equals the State death tax credit, the combined federal and State death taxes amounts to the federal estate tax unadjusted for the State death tax credit.

$$(4) \quad EB_3 = \{A - \sum_{k=1}^{\infty} P(N,k) [E(A [1+i]^k) / (1+i)^k]\}$$

$$(5) \quad EB_4 = \{A(1-\lambda G^*) - \sum_{k=1}^{\infty} P(N,k) [E(A(1-\lambda G^*) [1+i]^k) / (1+i)^k]\}$$

$$(6) \quad EB_5 = \{A(1-\lambda G) - \sum_{k=1}^{\infty} P(N,k) [E(A(1-\lambda G) [1+i]^k) / (1+i)^k]\}$$

The present value of expected bequest, bequest as a percentage of the initial value of property, and the effective inheritance tax liability under the various alternatives are computed and presented in Table 1 through 3. Before interpreting the tables, we observe the following:

First, the computations are made for an individual who is 65 years of age. The probability of death of this typical individual is computed from the life table for the U.S. for 1980, (USDHHS, 1982).

TABLE 1

Present Value of Expected Bequest (\$ '000)

(λ, i)	Initial Value of Property \$ 500					Initial Value of Property: \$ 1000					
	AL ₁	AL ₂	AL ₃	AL ₄	AL ₅	STAY	AL ₁	AL ₂	AL ₃	AL ₄	AL ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
(100,3)	*	349.67	*	387.07	378.01	*	575.65	*	645.20	632.38	
(100,6)	*	315.18	*	350.99	343.38	*	522.13	*	586.33	574.29	
(100,9)	*	287.47	*	320.83	313.98	*	487.37	*	544.00	532.34	
(50,3)	*	381.78	*	418.63	413.59	*	621.50	*	691.41	683.84	
(50,6)	*	342.12	*	377.75	373.40	*	566.02	*	629.78	622.64	
(50,9)	*	312.31	*	345.36	341.38	*	531.25	*	586.18	579.25	
(30,3)	*	404.11	*	440.94	438.53	*	655.51	*	725.60	721.86	
(30,6)	*	361.44	*	397.10	395.00	*	598.71	*	662.01	658.47	
(30,9)	*	330.41	*	363.27	361.34	*	564.10	*	617.58	614.14	
(0,3)	**	425.14	**	462.17	**	689.12	**	759.38	**	**	**
(0,6)	**	380.10	**	415.88	**	631.20	**	693.94	**	**	**
(0,9)	**	348.05	**	380.77	**	596.91	**	648.81	**	**	**

λ : Proportion of capital gains, expressed as per cent of the initial value.

i : Rate of interest.

AL₁ : Alternative 1, AL₂ : Alternative 2, AL₃ : Alternative 3, AL₄ : Alternative 4, and AL₅ : Alternative 5.

* : Because of the step-up in the basis of assets at death, only inheritance taxes are paid and the results of the last 3 rows apply regardless of appreciation in the assets held.

** : Because no capital gains exist, only inheritance taxes will be paid as in the column to the left.

TABLE 2

Present Value of Expected Bequest as Percentage of Initial Value of Property

(λ, i)	Initial value of Property: \$ 500 thousand					Initial value of Property: \$1000 thousand				
	AL ₁	AL ₂	AL ₃	AL ₄	AL ₅	AL ₁	AL ₂	AL ₃	AL ₄	AL ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(100,3)	*	62.93	*	77.41	75.60	*	57.57	*	64.52	63.24
(100,6)	*	63.04	*	70.20	68.68	*	52.21	*	58.63	57.43
(100,9)	*	57.49	*	64.17	62.80	*	48.74	*	54.40	53.23
(60,3)	*	76.36	*	83.73	82.72	*	62.15	*	69.14	68.38
(60,6)	*	68.42	*	75.55	74.68	*	56.60	*	62.98	62.26
(60,9)	*	62.46	*	69.07	68.28	*	53.13	*	58.62	57.93
(30,3)	*	80.82	*	88.19	87.71	*	65.55	*	72.56	72.19
(30,6)	*	72.29	*	79.42	79.00	*	59.97	*	66.20	65.85
(30,9)	*	66.08	*	72.65	72.27	*	56.41	*	61.76	61.41
(0,3)	85.03	**	92.43	**	**	68.91	**	75.94	**	**
(0,6)	76.02	**	83.18	**	**	63.12	**	69.39	**	**
(0,9)	69.61	**	76.15	**	**	59.69	**	64.88	**	**

See notes to Table 1.

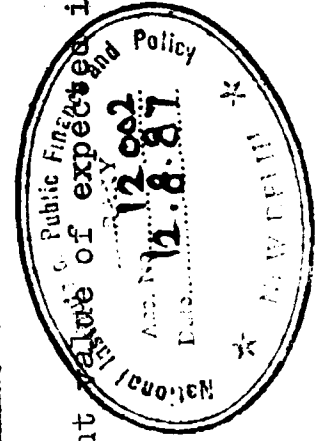
TABLE 3

Effective Inheritance/Death Tax Rate^a

(λ, i)	Initial Value of Property: \$500 thousand					Initial Value of Property: \$1000 thousand				
	STAY AL ₁	AL ₂	AL ₃	AL ₄	AL ₅	STAY AL ₁	AL ₂	AL ₃	AL ₄	AL ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(100, 3)	*	07.87	*	02.59	02.20	*	20.24	*	15.48	14.56
(100, 6)	*	14.76	*	09.80	09.12	*	25.59	*	21.37	20.37
(100, 9)	*	20.31	*	15.83	15.00	*	29.06	*	25.60	24.57
(60, 3)	*	10.32	*	04.27	03.96	*	24.53	*	18.86	18.30
(60, 6)	*	18.26	*	12.45	12.00	*	30.08	*	25.02	24.42
(60, 9)	*	24.22	*	18.93	18.40	*	33.56	*	29.38	28.76
(30, 3)	*	12.52	*	05.81	05.63	*	27.79	*	21.44	21.15
(30, 6)	*	21.05	*	14.58	14.34	*	33.47	*	27.80	27.49
(30, 9)	*	27.26	*	21.35	21.07	*	36.93	*	32.24	31.93
(0, 3)	14.97	**	07.57	**	**	31.09	**	24.06	**	**
(0, 6)	23.98	**	16.82	**	**	36.88	**	30.61	**	**
(0, 9)	30.39	**	23.85	**	**	40.31	**	35.12	**	**

^a per cent of the present value of property. inheritance/death tax liability in the initial value of property.

See notes to Table 1.



Second, several magnitudes are assumed for λ , the proportion of capital gains in the initial value of property - no capital gains, 30 per cent capital gains, 60 per cent capital gains and 100 per cent capital gains. Three interest rates are assumed for i - 3, 6 and 9 per cent.

Third, expected bequest is examined for two different initial wealth endowments: \$ 500,000 and 1,000,000.

Fourth, it is assumed that the switching operation results in instantaneous acquisition of new property earning at the rate i .

And finally, Wisconsin inheritance tax liability is computed by assuming that the property is bequeathed to 'lineal issue' which encompasses children and grandchildren of the deceased.

We explain the results of the computations for the assumed initial estate value of \$ 500,000. Columns (2) and (3) of Table 1 show the present value of expected bequest under the (stay, hold) alternative and (stay, switch) alternative respectively. Under the former alternative, the property is subject only to an inheritance tax in Wisconsin, while under the latter alternative, the property is subjected to both capital gains and inheritance taxes in the State. The present value of expected bequest for the (stay, hold) alternative is higher than that of the (stay, switch) alternative, because the initial values of

property available for future bequest is reduced under the (stay, switch) alternative by the capital gains tax.

Column (4) of Table 1 shows the present value of expected bequest in a 'typical State' when the property is subjected only to an inheritance tax, the (move, hold) alternative, and column (5) of the table shows the bequest value in the State when the property is subjected to a combination of federal capital gains tax and State death tax; the (move, switch) alternative. Comparison of the two columns shows the present value of expected bequest obtainable under the (move, hold) alternative is higher than the (move, switch) alternative. This is again for the obvious reason that the initial value of property is lower in the latter alternative due to the capital gains tax. Also, column (6) of the table provides the present value of bequest corresponding to a situation in which the property is subjected to capital gains tax in Wisconsin but the inheritance tax is paid in a 'typical State'; the (switch, move) alternative. In this case also, it is seen, the present value of expected bequest obtainable is less than that under the (move, hold) alternative.

From the above discussion, it is evident that among alternatives involving a decision to stay in Wisconsin, the (stay, hold) alternative provides relatively higher present value of expected bequest. Similarly, among alternatives involving a decision to move out of Wisconsin State, the (move, hold) alternative provides a relatively high expected bequest. A comparison between these two

alternatives columns (2) and (4) shows that the (move, hold) alternative yields comparatively higher present value of expected bequest. This aspect lends support to two inferences. First, the capital gains tax reduces the initial value of property and causes a reduction in the present value of expected bequest. Therefore, individuals with bequest motive prefer to move out of Wisconsin to States where there is no capital gains tax or where the capital gains tax is lower. Second, the relatively high inheritance tax in Wisconsin induces individuals to migrate to States where the death tax equals the federal death tax credit.

However, this second inference needs modification on a closer look at Table 2. Columns (2) and (4) of Table 2 show the percentage of the present value of expected bequest in the initial value of property in respect of the two alternatives: (stay, hold) and (move, hold). The difference in the percentages of bequest between these two alternatives shows a decreasing trend as the assumed rate of interest increases. The degree of difference declines from 7.40 to 7.16 and to 6.54 per cent for the assumed rates 3 per cent, 6 per cent and 9 per cent respectively.

This broadly suggests that, given an initial value of estate, the expected bequest is determined not only by the inheritance tax but also by the rate of return and capital appreciation of property. While the inheritance tax tends to reduce the expected bequest, the rate of return and capital appreciation may have an offsetting influence over the adverse effect of inheritance tax on the expected bequests.

It is evident that the inheritance tax system in Wisconsin is progressive compared to the 'typical State' where the tax is the least, equivalent to the federal death tax credit (Table 3). However, as noted above, the decision to migrate from Wisconsin State in view of its higher inheritance tax largely depends not only on the lower inheritance tax liability in the least-tax States but also on the relative rate of return and expected capital appreciation.

Another interesting aspect of the present analysis is that the assumed interest rate logically does not seem to have any such offsetting influence with regard to the capital gains tax. Capital gains tax reduces the initial value of an asset available for future bequest. As a matter of fact, if positive rate of return and capital appreciation are assumed, the reduction in future bequest due to the capital gains tax tend to be cumulative. In view of this, it seems that the relative capital gains tax liability may by itself induce relocation of individuals with bequest motive in a State where capital gains are either exempted or treated milder.

So far we were examining the relative advantages with regard to all five alternatives. Now we focus on the alternatives involving a decision to 'switch'. This analysis is important for two reasons. First, the retiring individual may be required to divest an interest in a business to avoid managerial roles inconsistent with retirement. Second, the (move, switch) alternative is not available to persons divesting themselves of real property.

The alternatives involving the decision to 'switch' are: (stay, switch), (move, switch) and (switch, move). Let us first compare the relative advantage resulting from the two alternatives, (move, switch) and (switch, move), because they involve a common decision component to 'move' out of the State. There does not seem to be of any considerable difference between the present values of expected bequest obtainable under these two alternatives, as evident from a comparison of columns (5) and (6) of Table 1. A comparison of columns (5) and (6) of Table 2 makes this point more explicit; the percentages of expected bequest in the initial value of property are almost identical under the two alternatives. This aspect needs some further explanation.

As described earlier, under the (move, switch) alternative, the property is subjected to both federal capital gains and State death taxes elsewhere. On the other hand, under the (switch, move) alternative, the property is subjected to both federal and State capital gains taxes inside Wisconsin and death tax elsewhere. It is interesting to note that under both alternatives, the property is liable to State death tax elsewhere. However, under the (move, switch) alternative, the State death tax elsewhere falls on a larger base, in the sense that there is no State capital gains tax on the initial value of property. On the contrary, under the (switch, move) alternative, the State death tax elsewhere falls on a smaller property base, in the sense that the value of property is already reduced by the Wisconsin capital gains tax. In this case, even though the State capital gains tax

reduces the initial value of property, the tax also thereby reduces the future inheritance tax liability. Therefore, the difference in the expected bequests under the two alternatives, (move, switch) and (switch, move), is not considerable. A close examination of columns (5) and (6) of Table 1 as well as Table 2 shows that the smaller the capital gains, the less the difference between the present values of expected bequest under the two alternatives.

Now let us compare the (stay, switch) alternative with the two 'switch' alternatives, (move, switch) and (switch, move), which involve a decision to 'move' out of the State. The present value of expected bequests under the (stay, switch) alternative is lower than both 'switch' alternatives involving a decision to 'move' out of the State. This is observable from columns (3), (5) and (6) of Table 1. The same aspect is also brought to light by columns (3), (5) and (6) of Table 2, which show the percentages of the present value of expected bequest in the initial value of property. From this it seems that it is relatively advantageous for the individual to move out of the State to benefit from 'switching' of property. The inducement for this comes from the fact that not only does the capital gains tax inside the State reduce the initial value of property but also the property is subjected to a relatively progressive inheritance tax in the State compared to that of a 'typical' State where the death tax rate is the least. Nevertheless, this result also needs to be qualified by the earlier inference that the higher the rate of return and capital appreciation in the State compared to elsewhere, lower would be the relative advantage of 'moving' out of the State so as to maximise the expected bequest.

Summary

The present study analyses the effect of inheritance and capital gains taxes on individual decisions to migrate from Wisconsin State to other States. The study is important for its implications on the net flow of capital from the State. The analysis assumes that the objective of the individual is to maximise the present value of his expected bequest net of taxes. The present values of expected bequest under the five alternative - (stay, hold), (stay, switch), (move, hold), (move, switch) and (switch, move) - in Wisconsin are analysed vis-a-vis a 'typical' State where the capital gains and inheritance taxes are the least. The study shows that: (i) individuals with bequest motive are likely to move out of Wisconsin to States where there is no or much lower capital gains tax, (ii) the relatively high inheritance tax in Wisconsin induces individuals to migrate to States where the State death tax equals the federal death tax credit. This latter inference needs modification. The decision to migrate from Wisconsin State in view of its higher inheritance tax depends not only on the lower inheritance tax liability existing in States where the State death tax equals the federal death tax credit, but also on the relative rate of return and expected capital appreciation in the low-tax State. An interesting aspect is that the relative rate of return does not seem to have any such off-setting influence with regard to the capital gains tax.

A close look at the alternatives involving a decision to 'switch' shows that the difference in the expected bequest under the two alternatives - (move, switch) and (switch, move) - is not considerable. Moreover, smaller the capital gains, the smaller the difference between the present values of expected bequest under these two alternatives. A comparison between the above two switch alternatives and the (stay, switch) alternative shows that the present value of expected bequest under the latter alternative is lower than both the 'switch' alternatives involving a decision to move out of Wisconsin State. From this it seems that it is relatively advantageous for the individual to move out of the State to benefit from 'switching' of property. Nevertheless this result also needs to be qualified by the earliest inference that the higher the rate of return and capital appreciation in the State compared to elsewhere, lower would be the relative advantage of 'moving' out of the State so as to maximise the expected bequest.

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